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(54) Title: AMMONIA DETECTION AND MEASUREMENT DEVICE

(57) Abstract: There is disclosed an apparatus and method for detecting and measuring volatile acidic or basic components including ammonia, ammonium, or volatile amines (compound) in a gas or liquid state fluid. Specifically, the present invention provides a PTFE-carrier solid phase indicator film having ammonia-sensitive indicator dye embedded therein, such that the dye moiety changes color or spectral properties upon exposure to the compound to be detected.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/42051**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G01N 33/00, 33/18, 21/25, 21/62

US CL : Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 422/55, 56, 57, 61, 82.05, 82.06, 82.07, 82.08, 82.09; 436/100, 101, 111, 112, 113, 129, 163, 166, 169, 172

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X - Y	W. SELLIEN et al "Development of an Optical-Chemical Sensor for the Detection of Ammonium Ions" Analytical Chemica Acta 1992, Vol. 269, pages 83-88, see entire document.	1-5,7-8,10 ----- 6,9
Y	G. F. KIRKBRIGHT et al "Studies with Immobilised Chemical Reagents Using a Flow-Cell for the Development of Chemically Sensitive Optical Fibre Devices" Analyst January 1984, Vol. 109, pages 15-17, see entire document.	1-10

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

12 MARCH 2001

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/42051

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	W. A. WYATT et al "Characterization and Comparison of Three Optical-Fibre Sensors for Iodide Determination Based on Dynamic Fluorescence Quenching of Rhodamine 6G" Analytical Chemistry 15 September 1987, Vol. 59, No. 18, pages 2272-2276, see entire document.	1-10
Y	M. BACCI et al "Spectrophotometric Investigations on Immobilized Acid-Base Indicators" Analytica Chimica Acta 15 April 1988, Vol. 207, pages 343-348, see entire document.	1-10
Y	Chemical Abstracts, Vol. 121, No. 4, issued 25 July 1994, A. MORALES-BAHNIK et al "An Optochemical Ammonia Sensor Based on Immobilized Metalloporphyrins" page 401, column 2, abstract no. 41603j, Sens. Actuators, B 1994, 19, 493-496, see entire document.	1-10
Y	US 5,322,797 A (MALLOW et al) 21 June 1994, see entire document.	6
A	US 4,201,548 A (TAMAOKA et al) 06 May 1980.	1-10
A	EP 169055 A (TECHNICON INSTRUMENTS CORPORATION) 22 January 1986.	1-10
A	D. CUI et al "Optical Fibre pH Sensor Based on Immobilized Indicator" SPIE 1991, Vol. 1572, pages 386-391.	1-10
A	US 5,494,640 A (SIMON et al) 27 February 1996.	1-10
A	EP 928966 A (EIGENOSISCHE TECHNISCHE HOCHSCHULE ZURICH) 14 July 1999.	1-10

A. CLASSIFICATION OF SUBJECT MATTER:

US CL :

422/55, 56, 57, 61, 82.05, 82.06, 82.07, 82.08, 82.09; 436/100, 101, 111, 112, 113, 129, 163, 166, 169, 172

B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

STN search in CA and REGISTRY files. Search terms: methyl crystal purple, methylcrystal purple, ptfe, teflon, goretex, gore tex, tetrafluoroeth?, polytetrafluoroeth?, polyflon, ammonia, hydrochloric acid, acetic acid, methylamine, dimethylamine, detect?, determin?, measur?, Monitor?, analy?, assay?, test?, estimat?, evaluat?, sense#, sensing, sensor, colorim?, fluorim?, fluorescen?, spectrophotom?, methyl, purple, poly, polymer, homopolymer, bromophenol, bromocresol, thymol, chlorophenol, phenol red, tetraphenylporph?, h2tpp, http, immobil?, adsor?, indicator, dye, pigment, acid##, base, basic, ph, fluorophore, entrap?, nh3, nh4, hcl, hoac, ch3cooh, ch3co2h